WHAT IS CLAIMED IS:

1. A method of determining at least one characteristic of a tire selected from: the x component, y component, and z component of a resultant of forces which are exerted by the road on the contact area of a tire, the self-alignment torque generated by the tire, the camber and the pressure, the method comprising the steps of measuring stresses in at least one bead of the tire at at least three fixed points in space, and deriving the characteristic from said at least one measurement.

2. The method according to Claim 1, wherein the measurement of the stresses is performed in a rubber component whose Young's modulus is more than 5 MPa at 10% strain.

3. The method according to Claim 1, the said three fixed points being selected such that:

   one of the points corresponds to the azimuth of the center of the contact area or the azimuth of the point opposite to the contact area; and,

   two other points are symmetrical with respect to a vertical plane passing through the center of the contact area.

4. The method according to Claim 3, in which, the measurement azimuths being selected symmetrically with respect to the azimuth of the center of the contact area ($180°+\alpha$ and $180°-\alpha°$), with α not equal to $0°$ or $180°$, V_1^1 and V_2^1 being values measured at these azimuths on a first bead and V_1^2 and V_2^2 being the values measured at these azimuths on a second bead, an estimate of the component Fx is provided by $f_x(a_1V_1^1+a_2V_2^1+b_1V_1^2+b_2V_2^2)$, where a_1, a_2, b_1 and b_2 are positive real coefficients and f_x is a monotonic continuous function.

5. The method according to Claim 3, in which, the measurement azimuths being selected symmetrically with respect to the azimuth of the center of the contact area ($180°+\alpha$ and $180°-\alpha°$), with α not equal to $0°$ or $180°$, V_1^1 and V_2^1 being values measured at these azimuths on the first bead and V_1^2 and V_2^2 being values measured

at these azimuths on the second bead, an estimate of the component Fz is provided by $f_z(c_1V_1^{\ 1}-c_2V_2^{\ 1}+d_1V_1^{\ 2}-d_2V_2^{\ 2})$, where c_1, c_2, d_1 and d_2 are positive real coefficients and f_z is a monotonic continuous function.

6. The method according to Claim 3, in which, the measurement azimuths being selected symmetrically with respect to the azimuth of the center of the contact area ($180°+\alpha$ and $180°-\alpha°$), with α not equal to $0°$ or $180°$, $V_1^{\ 1}$ and $V_2^{\ 1}$ being values measured at these azimuths on the first bead and $V_1^{\ 2}$ and $V_2^{\ 2}$ being values measured at these azimuths on the second bead, an estimate of the self-alignment torque N is provided by $f_n(e_1V_1^{\ 1}+e_2V_2^{\ 1}-f_1V_1^{\ 2}-f_2V_2^{\ 2})$, where e_1, e_2, f_1 and f_2 are positive real coefficients and f_n is a monotonic continuous function.

7. The method according to Claim 3, in which, the measurement azimuths being selected symmetrically with respect to the azimuth of the center of the contact area ($180°+\alpha$ and $180°-\alpha°$), with α not equal to $0°$ or $180°$, $V_1^{\ 1}$ and $V_2^{\ 1}$ being values measured at these azimuths on the first bead and $V_1^{\ 2}$ and $V_2^{\ 2}$ being values measured at these azimuths on the second bead, an estimate of the component Fy is provided by $f_y(g_1V_1^{\ 1}-g_2V_2^{\ 1}-h_1V_1^{\ 2}+h_2V_2^{\ 2})$, where g_1, g_2, h_1 and h_2 are positive real coefficients and f_y is a monotonic continuous function.

8. The method according to Claim 3, in which, the measurement azimuths being selected symmetrically with respect to the azimuth of the center of the contact area ($180°+\alpha$ and $180°-\alpha°$), with α not equal to $0°$ or $180°$, and V_1 and V_2 being values measured at these other azimuths, an estimate of Fz is provided by $f_z(r_2V_2-r_1V_1)$, where r_1 and r_2 are positive real coefficients and f_z is a monotonic continuous function.

9. The method according to Claim 3, in which, one of the azimuths corresponding to the middle of the contact area (azimuth $180°$) and V_c being a value measured at this azimuth, the other measurement azimuths being selected symmetrically with respect to the azimuth of the center of the contact area ($180°+\alpha$ and $180°-\alpha°$), with α not equal to $0°$ or $180°$, and V_1 and V_2 being values measured at these other azimuths,

an estimate of Fy is provided by $f_y(s_c V_c - (s_1 V_1 + s_2 V_2))$, where s_1, s_2 and s_c are positive real coefficients and f_y is a monotonic continuous function.

10. The method according to Claim 3, in which, one of the azimuths corresponding to the middle of the contact area (azimuth 180°) and V_c being a value measured at this azimuth, the other measurement azimuths being selected symmetrically with respect to the azimuth of the center of the contact area (180°+α and 180°-α°), with α not equal to 0° or 180°, and V_1 and V_2 being values measured at these other azimuths, an estimate of Fx is provided by $f_x(u_c V_c + u_1 V_1 + u_2 V_2)$, where u_1, u_2 and u_c are positive real coefficients and f_x is a monotonic continuous function.

11. The method according to Claim 1, wherein to estimate camber angle, the method comprises determining a difference in stresses being exerted in each of the beads on the basis of the measurements of stresses in the beads.

12. The method according to Claim 1, wherein, to estimate pressure a contribution due to the pneumatic behaviour separate from a contribution due to structural behaviour is determined on the basis of the measurements of stresses in the beads.

13. A method of determining at least one characteristic of a tire selected from: the x component, y component and z component of a resultant of forces which are exerted by the road on the contact area of the tire, the self-alignment torque generated by the tire, the camber, and the pressure, the method comprising the steps of:

determining measurement azimuths and collecting values for circumferential shear stress in a bead on at least one side of the tire while soliciting varied stresses on the tire, which stresses are selected to cover the full range in which evaluation of the at least one selected characteristic will be permitted in normal use, the solicited stresses selected to create all the couplings expected during normal use,

reading measured values for circumferential shear stress in the bead and reading values of the at least one characteristic associated with the measured values to form a training base, the values of the at least one characteristic being obtained through measurement means different from the means for the measured values,

determining coefficients of a transfer function for establishing a link between the measured values and the values of the at least one selected characteristic on the basis of the training base, and,

testing the transfer functions by making and comparing estimates of the at least one selected characteristic with the values obtained by different measurement means.

14. The method of determination according to Claim 13, in which the transfer function is a network having one layer of hidden neurons and one layer of output neurons.